

REMARKS

The examiner objected to the title, indicating that a new title is required indicative of the invention. Applicants have amended the title and respectfully request that the objection be withdrawn.

Claim Rejections Under 35 U.S.C. § 112

The examiner rejected claims 1-17 under 35 U.S.C. 112, second paragraph as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention. Applicant respectfully disagrees. Applicants further note that the examiner was not able to clearly discern from the specification the association and interconnection of the apparatus in FIG.1 and the apparatus of FIG. 3. Applicants believe that a further review of the specification guided by these comments will establish that the specification complies with the provisions of 35 U.S.C. 112.

As noted in the specification, FIG. 1A is a diagrammatic representation of a multiple electron beam inspection system 100 using uniform focus and deflection fields. As further explained, the uniform magnetic field is created using the two polepieces 104 and electrostatic deflection is performed using two deflection plates 114 (a second not shown). See page 9, line 1 to page 10, line 1. Greater detail as to the use of a pair of deflection plates to provide a uniform deflection field across a plurality of electron beams is provided in the top view in FIG. 1B. Voltage applied to the deflector plates 114 and 115 creates an electrostatic field. The combination of the uniform magnetic field and the uniform electrostatic field provides a net EXB force as illustrated in FIG. 1B (page 11, lines 10-20 and page 12, lines 10-20.)

FIG. 3 is a further illustration of the inspection system, illustrating in further detail the cathode array and example voltages and forces applied. As described in the specification, the cathode array includes multiple Schottky tips (thermal field emission sources) which are known to those of skilled in the art to be one example of a cathode. The direction of the uniform magnetic forces 304, the electrostatic deflection forces 308 and the net force 305 are illustrated therein. Neither the polepieces nor the deflectors are illustrated in this Figure 3. Instead, the vectors 304, 305, and 308 resulting from the polepieces and deflectors are shown. Further illustration of the effects of these forces as well as the extracting, decelerating, and retarding electrodes can be obtained from viewing FIG. 5.

Applicant believes that in light of the foregoing explanation, one skilled in the art would therefore understand how to use and make the present invention by reading the specification. The specification need not teach and preferably omits what is well known in the art. MPEP 2164.01. Withdrawal of the rejection is respectfully requested.

The examiner objected to claims 1 and 12 indicating that it was unclear whether two thermal field emission sources and two detectors had been claimed. Applicants respectfully disagree. Applicants believe that the first and second designations make clear that there are two sources and detectors but have further amended the claim with respect to the use of the term detector.

The examiner also objected to claim 15, indicating that it is unclear as to what a “computer readable medium” represents. Applicant respectfully disagrees. The meaning of this term is well known in the art to include for example , and without limitation, magnetic media such as hard disks, floppy disks, and magnetic tape; optical media such as CD-ROM disks; magneto-optical media such as floptical disks; and hardware devices that are specially configured to store and perform program instructions, such as read-only memory devices (ROM) and random access memory (RAM). Withdrawal of the rejections is respectfully requested.

In view of the above discussion, it is respectfully asserted that pending claims 1- 17 meet the statutory requirements of 35 USC §112, first and second paragraphs. Withdrawal of the rejections under these sections is respectfully requested.

Claim Rejections Under 35 U.S.C. §§ 103

Claims 1-3, 8, 12-13, 15 and 17 were rejected under 35 USC 103(a) as being unpatentable over Shirai, (US 4,209,702) The rejections are respectfully traversed. Clarifications have been made in the amendments to claims 1,12 and 15.

Shirai generally describes an electron beam exposure device to expose the sample and thus reproduce LSI patterns on the sample (3:7-16; 4:52-56). More specifically, a multiple electron beam lens is described that has a plurality of beam paths to accommodate electron beams (1:29-34). In contrast, the present application recites in claim 1 a multiple beam inspection system for inspecting a sample. Thus, not only are the systems different in purpose but they also differ in the configuration of elements.

For example, contrary to the Examiner’s indications, Shirai does not disclose a

deflector for directing the first and second incident electron beam towards the first and second portion of the sample. Shirai describes 3 scanning deflectors each for scanning only one of the 3 electron beams to draw desired patterns on the specimen (4:20-25). This neither teaches nor suggests the deflector of claim 1 acting on both of the first and second incident electron beams. That is, none of the deflectors described in Shirai are shared by electron beams. This is important in that using shared deflectors allows a reduction in size in the inspection system which would not be available by using the individual deflectors of Shirai. Further, there is no teaching or suggestion in Shirai that the deflectors act on the electron beam output from the sample. It is noteworthy that Shirai is directed to a system that uses an electron beam to expose a pattern on a wafer as opposed to the inspection system of the present invention, which uses the electron beam to inspect a sample. Thus, detectors would not likely be necessary for the operation of the system in Shirai, as evidence by the omission of discussion of a detector in reference to Shirai FIG. 4.

Shirai describes 3 electron guns 40 to emit irradiating electron beams for directly exposing LSI patterns on the specimen (4:40-44). These are neither thermal field emission sources nor are they used for inspecting the sample, as required in claim 1

The examiner correctly notes that Shirai doesn't feature a detector but points out that it would have been well known for one of ordinary skill in the art to provide a detector such as shown by Shirai in FIG. 2. Applicants respectfully disagree. Even combining FIGS. 2 and 4, Shirai would fail to disclose this element. Claim 1 recites "a first and second detector to detect respectively a first and a second detection electron beam output from the sample". Shirai in prior art FIG. 2 mentions only a single secondary electron monitor and makes no suggestion that multiple detectors would be appropriate or present in the system depicted in FIG. 4.

For the same reasons as discussed above with respect to claim 1, applicants submit that claims 12 and 17 are allowable over the art of record.

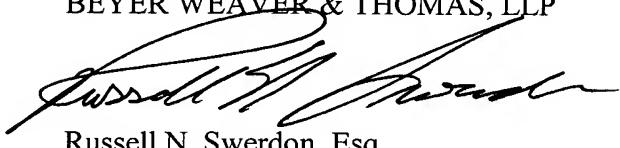
Claims 2-11 and 13-16 are dependant claims, submitted to be allowable at least due to their dependencies from an allowable independent claim.

Conclusion

In view of the foregoing, Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

No fees are believed due in connection with the filing of this paper.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP



Russell N. Swerdon, Esq.
Registration No. 36,943

P.O. Box 778
Berkeley, CA 94704-0778
Telephone (510) 843-6200